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**Interim Record of Decision for Oak Ridge National Laboratory Waste
Area Grouping 11 Surface Debris, Oak Ridge, Tennessee**

September 1992

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U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

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ACRONYMS AND INITIALISMS

ACM	asbestos-containing material
ALARA	as low as reasonably achievable
ARARs	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
Energy Systems	Martin Marietta Energy Systems, Inc.
EPA	U.S. Environmental Protection Agency
FS	feasibility study
IROD	Interim Record of Decision
O&M	operation and maintenance
ORNL	Oak Ridge National Laboratory
ORR	Oak Ridge Reservation
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
TBC	to be considered
TCA	Tennessee Code Annotated
TDEC	Tennessee Department of Environment and Conservation
WAG	Waste Area Grouping

PART 1. DECLARATION

SITE NAME AND LOCATION

Waste Area Grouping (WAG) 11
Oak Ridge National Laboratory (ORNL)
Oak Ridge Reservation (ORR)
Oak Ridge, Tennessee

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected interim remedial action for ORNL WAG 11 surface debris. This action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 as amended by the Superfund Amendments and Reauthorization Act, and, to the extent practicable, the National Oil and Hazardous Substance Contingency Plan. This decision is based on the administrative record for this site.

The State of Tennessee and the U.S. Environmental Protection Agency (EPA) concur with this interim action for the WAG 11 remediation.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Interim Record of Decision (IROD), may present a current or potential threat to public health, welfare, or the environment.

DESCRIPTION OF SELECTED REMEDY

This interim action is intended to reduce the threats to human health and the environment posed by a variety of radiological and physical hazards located within the bounds of WAG 11.

The major components of this interim action are:

- collection and segregation of all surface debris at WAG 11 and
- transportation and disposal of debris in WAG 6.

This interim action is not the final action planned for the site, but will provide a significant reduction in the threats to human health and the environment by isolating the waste from the environment. After the contaminated surface debris is addressed, a Remedial Investigation (RI)/Feasibility Study (FS) is planned that could result in more remedial actions or a decision to take no further action. Interim remedial action on WAG 11 prior to completion of the RI/FS will provide additional benefits consistent with the goals of CERCLA, including:

- a reduction in further degradation of the environment by eliminating surface debris as a source of further environmental contamination;
- a reduction in the difficulty, expense, and possible physical harm associated with site surveillance, maintenance activities, and future remedial actions by eliminating debris that interferes with mowing, clearing, and characterizing the site; and
- an increased likelihood of success for future subsurface investigations by eliminating surface debris that interferes with most subsurface investigative methods.

STATUTORY DETERMINATION

The selected remedy is protective of human health and the environment, complies with federal and state requirements that are applicable or relevant and appropriate to the remedial action and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. However, because this is an interim action, remedies employing treatment that reduces toxicity, mobility, or volume as a principal element of the remedial action will be addressed by the final response action. Subsequent actions are planned to address fully the principal threats posed by the site. Review of this site and of this remedy will be continuing as part of the development of the final remedy for the site. Because this remedy will result in hazardous substances remaining on the site, a review will be conducted within five years after commencement of the remedial action as final remedial alternatives are developed.

PART 2. DECISION SUMMARY

SITE NAME, LOCATION, AND DESCRIPTION

WAG 11 is 1 mile east of the intersection of Highways 58 and 95 in the McNew Hollow area just north of Pine Ridge. The site occupies approximately 30 acres in Roane County, Tennessee, and is within the boundaries of the DOE ORR. WAG 11 is approximately 3 miles from the western edge of the city of Oak Ridge, the closest population center. Figure 1 shows the geographic location of the site.

Formerly known as White Wing Scrap Yard, WAG 11 is partially wooded and thickly vegetated. A forest of small pine trees covers about 30% of the site, while the remaining area is covered by mixed grass, brush, and young hardwoods. The site lies within the Bear Creek drainage basin near the junction of Bear Creek and East Fork Poplar Creek. All surface water flow within the WAG is to Bear Creek along two unnamed tributaries. Hot Yard Road bisects the site, and East Fork Ridge Road generally parallels the northern boundary. A site map depicting significant geographical and topographical information about WAG 11 is presented in Fig. 2.

SITE HISTORY AND ENFORCEMENT ACTIVITIES

WAG 11 was a storage area for radioactively contaminated scrap and debris from the Oak Ridge National Laboratory (ORNL), the Y-12 Plant (Y-12) and the K-25 Plant (formerly the Oak Ridge Gaseous Diffusion Plant). Material (steel tanks, metal, glass, concrete, and miscellaneous industrial trash) with alpha, beta, and gamma contamination was first stored at the White Wing Scrap Yard in the early 1950s; however, precise dates of operation are uncertain. During active use, the area of the scrap yard north of Hot Yard Road was enclosed with a chain link fence, and the area south of the road was fenced with barbed wire.

In 1966, efforts began to clean up the site in preparation for the proposed relocation of White Wing Road. Most of the larger surface scrap was removed and buried in ORNL's Solid Waste Storage Area 5. Site cleanup continued into October 1970 with the removal of approximately 6000 yd³ of contaminated soil from the site. All fences were removed during these activities.

ORNL conducted a limited sampling effort in 1987 and 1988 for the purposes of gaining information on the geology, hydrology, soils, and geochemistry of WAG 11, as well as information on releases and inventory of hazardous materials in WAG 11, for use in the design of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (ORNL April 1988). ORNL sampled and analyzed groundwater, surface water, mud, gravel, and soil.

On November 10, 1989, the site was roped and placarded with "Controlled Area" signs at 50-ft intervals and Tennessee Wildlife Resources Agency safety zone signs at 100-ft intervals to exclude deer hunters and other intruders from the site.

A surface radiological scoping survey of accessible areas at WAG 11 was conducted intermittently from December 1989 through July 1991 by ORNL (ORNL September 1991). The purpose of this investigation was to provide an updated contamination status of the site and a basis for the formulation of interim corrective actions that will limit human exposures to radioactivity and minimize the potential for contaminant dispersion.

On December 21, 1989, the ORR was placed on CERCLA's National Priorities List, which mandates specific requirements that environmental restoration activities must follow. An Interim Remedial Measures Study (Radian July 1992) was completed in July 1992 to determine the best alternative for reducing the potential health threat posed by contaminated surface debris on WAG 11.

HIGHLIGHTS OF COMMUNITY PARTICIPATION

The Proposed Plan for the ORNL WAG 11 Interim Remedial Action was released to the public in July 1992 by inclusion in the administrative record maintained at the Information Resource Center in Oak Ridge, Tennessee. Notice of availability of the proposed plan was published in the Oak Ridger on July 10, 12, and 15, 1992; in the Knoxville News-Sentinel on July 10, 12, and 15, 1992; and in the Roane County News on July 13, 15, and 17, 1992.

A public comment period was held from July 14 through August 12, 1992. A public meeting was not scheduled, but opportunity for a meeting was offered in the published notice of availability.

A response to the comments received during the comment period is included in the Responsiveness Summary, which is part 3 of this IROD. This decision document presents the selected interim remedial action for the ORNL WAG 11 surface debris. This selection was made in accordance with CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent feasible, the National Contingency Plan.

SCOPE AND ROLE OF THE RESPONSE ACTION

The purpose of this interim remedial action is to reduce the potential threat to human health and the environment from the radiologically contaminated scrap and debris lying on the surface of WAG 11. This interim action will reduce the potential threat to human health posed by physical hazards to an inadvertent intruder and the possible spread of radioactive contamination by that intruder. Collection and disposal of the contaminated debris will provide a significant reduction in the threat to human health and the environment by isolating the waste from the environment. Subsequent actions under CERCLA are planned to fully address the threats posed by the remaining exposure pathways at the site. These may include, but are not limited to, the soils, groundwater, and surface water. The site will be evaluated during the RI/FS, as mandated in CERCLA.

This interim action is consistent with planned future activities at the site. In particular, this interim remedial action will provide a reduction in the difficulty, expense, and possible future harm associated with site surveillance, maintenance activities, and future remedial activities by eliminating debris that interferes with mowing, clearing, and characterizing the site. This remedial action will also increase the likelihood of success of future subsurface investigations by eliminating surface debris that interferes with most subsurface investigative methods.

SUMMARY OF SITE CHARACTERISTICS

Contaminated surface debris that litters much of the surface of WAG 11 is a result of the intentional storage on the site of contaminated scrap, debris, and industrial waste. A cleanup of the site was conducted by DOE in the late 1960s and 1970s; however, some large pieces and a

large quantity of smaller contaminated debris still remain scattered throughout the site. Measurement surveys of alpha, beta, and gamma radiation have revealed that contaminants are present on some of the debris in levels high enough to be of concern. Swipe sample analytical results have shown elevated concentrations of [238]U, [137]Cs, and other isotopes. Results of radiological surveys on the debris range from 0.5 mrad/h to 21 mrad/h. Physical hazards include sharp pieces of metal and broken glass on the ground surface.

SUMMARY OF SITE RISKS

WAG 11 is covered with contaminated debris, including pieces of metal, glass, graphite, concrete, plastic, wood, and composite materials. Visual inspections and radiation measurements made on the surface of the debris have identified a variety of radiological and physical hazards.

Radiological hazards at the site can present both internal and external exposures to those accessing it. Physical hazards include sharp pieces of metal and broken glass lying on the ground that may cause accident or injury. A person who trips or falls could be seriously injured by being cut or punctured. Injury from contaminated material could potentially cause radiological contaminants to enter the bloodstream, resulting in internal exposure. Material at the site could also be picked up and carried on by wildlife or someone unaware of the contamination, inadvertently exposing others to radiation and spreading the contamination off-site. Asbestos-containing materials (ACM) are also present on the surface and are a potential threat.

Contaminated debris at WAG 11 also presents an ecological risk. Wildlife is exposed to the same types of hazards as those associated with human health risk, including the possibility of puncture wounds and exposure to ionizing radiation. Additionally, contaminated vegetation is probable on the site, and consequently, the potential exists for radionuclide transfer to higher levels in the ecological food chain.

DESCRIPTION OF ALTERNATIVES

This section provides a description of how each alternative will address the contaminated surface debris found at WAG 11. Four alternatives are presented. These alternatives are not intended to remediate the entire WAG 11 site; instead, they are intended to reduce the risks associated with contaminated surface debris. Remediation of the entire site would be addressed in future CERCLA actions.

Alternative 1-No Action

CERCLA requires that the "no-action" alternative be evaluated to serve as the baseline for comparison at every site. Under this alternative, no further action will be taken to reduce the potential threat to human health and the environment caused by contaminated scrap and debris on the surface of WAG 11. This alternative will cost nothing to implement.

Alternative 2-Stage All Debris On-Site

This alternative consists of collecting all surface debris and placing it in an on-site staging facility. Activities include clearing vegetation from inaccessible areas, collection of light and heavy surface debris and ACM, containerization of debris, and construction of an on-site staging facility. Containerized debris will then be placed in the staging facility until a final remedial action is chosen. Implementation of this alternative will considerably reduce physical hazards for personnel involved in future investigations, the final remedial solution, and routine maintenance of WAG 11. Since the debris has been a source of contamination in the

soil and other media at WAG 11, implementing this temporary measure will help stabilize the site and prevent further degradation to the environment.

Implementation of this alternative will take approximately 10 months. The present worth cost for this alternative, including implementation or capital cost (including engineering design and construction) and operation and maintenance (O&M) cost, is estimated to be \$348,000.

Alternative 3-Decontaminate Metal Debris and Stage Remaining Debris On-Site

This alternative consists of collecting all surface debris, decontaminating metal debris, containerization of non-metal debris and ACM, and construction of an on-site staging facility for the storage of non-metal debris. Vegetation clearing activities identical to those for Alternative 2 will be required. Metal debris will be decontaminated using both physical and chemical processes to remove contamination in successive layers from the debris' surface. Decontaminated metal debris will be released to an operational DOE scrap metal facility for final disposition. Implementation of this alternative will considerably reduce physical hazards for personnel involved in future investigations, the final remedial solution, and routine maintenance of WAG 11. Since the debris has been a source of contamination for the soil and other media at WAG 11, implementing this temporary measure will aid in stabilizing the site and preventing further degradation to the environment. In addition, the amount of debris to be staged will be minimized by decontaminating and removing the metal from the site.

Implementation of this alternative will take approximately 12 months. The present worth cost for this alternative, including implementation or capital cost (including engineering design and construction) and O&M cost, is estimated to be \$529,000.

Alternative 4-Disposal of Debris in WAG 6

This alternative consists of collecting all surface debris and removing it from the site. Activities include clearing surface vegetation, collecting surface debris, and transporting and placing the debris in the WAG 6 waste consolidation area. Lead bricks and any vessels containing liquids will be segregated from other debris. Lead bricks will be decontaminated and reused or disposed of under an existing Martin Marietta Energy Systems, Inc., (Energy Systems) waste management program. If reuse is not feasible, the decontaminated lead will be managed under Energy Systems RCRA programs.

Surface vessels containing free liquids will be flagged for characterization and disposal in an operational waste management facility rather than in WAG 6.

All other surface debris will be collected, segregated based on surface radiological measurements, and placed in covered dump trucks and/or boxes and transported to the WAG 6 Waste Consolidation Area for disposal. The design and operation of these facilities emphasize isolation of the wastes from groundwater, surface water, and infiltration, as well as void space control to minimize future settling. By placing the debris beneath an engineered cover system, the potential for contaminants to enter the environment decreases.

Implementation of this alternative will take approximately 4 months. The present worth cost for this alternative is estimated to be \$160,000. The disposal techniques for this alternative have been modified as noted in the section titled Explanation of Significant Changes (page 2-15).

SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

This section provides a basis for determining which alternative provides the "best balance of tradeoffs" with respect to nine evaluation criteria. These criteria are:

- overall protection of human health and the environment;
- compliance with applicable or relevant and appropriate requirements (ARARs);
- long-term effectiveness and permanence;
- reduction of toxicity, mobility, or volume through treatment;
- short-term effectiveness;
- implementability;
- cost;
- regulatory agency acceptance; and
- community acceptance.

Overall Protection of Human Health and the Environment

Alternative 1, No Action, is not protective of and offers no reduction in risk to human health and the environment. Alternatives 2, 3, and 4 will equally reduce the risk associated with surface debris and offer a moderate degree of protection. However, Alternative 4 offers the greatest degree of overall protection of human health and the environment. Disposing of the debris in WAG 6 results in reduced handling and processing of the waste and provides for its long-term disposition.

Compliance with ARARs

Table 1 provides a summary of ARARs for the remedial action. Alternatives 2, 3, and 4 will comply with all listed ARARs.

Long-Term Effectiveness and Permanence

Alternative 1 provides no long-term effectiveness. Alternatives 2, 3, and 4 provide high long-term effectiveness in preventing surface debris from further degrading the environment. Alternative 4 also provides for long-term disposition of all surface debris; therefore, Alternative 4 has the highest degree of long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume Through Treatment

Alternative 1, No Action, does nothing to reduce toxicity, mobility, or volume of WAG 11 surface debris. Alternatives 2 and 4 do not incorporate any treatment technologies for reducing contaminant toxicity, mobility, or volume. Alternative 3 could increase or decrease the volume of waste depending on the method used to decontaminate the metal debris.

Short-Term Effectiveness

Alternative 1 provides no short-term effectiveness. Alternatives 2, 3, and 4 will take quick action to protect human health and the environment in the short term while a final remedial solution for the entire site is being developed. However, Alternatives 2, 3, and 4 involve handling and processing waste, with Alternative 3 requiring the greatest degree of handling, and hence, the greatest worker exposure.

Implementability

Alternatives 1, 2, 3, and 4 are all technically and administratively implementable. Of the action alternatives, Alternative 4 appears to have the lowest degree of implementation requirements with respect to design and engineering requirements. However, it has a higher degree of administrative requirements because the material must be transported and disposed of at another WAG on the ORR.

Cost

Alternative 1 does not involve any cost. Alternative 2 costs \$348,000. Alternative 3 costs \$529,000. Alternative 4 costs \$160,000.

State Acceptance

The State of Tennessee has reviewed the alternatives proposed for interim action at WAG 11. TDEC concurs with the selection of Alternative 4.

Community Acceptance

During the public comment period for the Proposed Plan, several comments and questions were presented about the proposed alternative. In general, the public agreed with the selection of Alternative 4. The Responsiveness Summary of this IROD addresses the questions and comments from the public in detail.

The Selected Remedy

Based on consideration of the requirements of CERCLA, the detailed analysis of alternatives, and public comments, the most appropriate remedy for the WAG 11 surface debris is a variation of Alternative 4, Dispose of Debris in WAG 6. The disposal techniques for the selected remedy have been modified as noted in the section titled Explanation of Significant Changes (page 2-15). An estimated 10,000 ft³ of debris will be manually collected from the surface of WAG 11. Lead surface debris (lead bricks) and any vessels containing liquid will be segregated from the other debris. The remaining debris will then be segregated (detectable radioactivity vs nondetectable), collected and placed in covered dump trucks and/or boxes, and transported to WAG 6 for disposal. Debris will be placed in the waste consolidation area located in WAG 6. WAG 6 is scheduled to be closed under a CERCLA remediation in the near future.

The costs of the variation of Alternative 4 presented in Table 2 are based on best engineering estimates of vegetation cover and debris volume. All costs were developed for comparison with other alternatives and may not represent the actual costs. Changes may be made to the remedy as part of the remedial design and construction processes. Such changes, in general, reflect modifications resulting from the engineering design process.

STATUTORY DETERMINATIONS

Under its legal authority, the DOE's primary responsibility at CERCLA sites is to undertake remedial actions that achieve adequate protection of human health and the environment. In addition, Sect. 121 of CERCLA establishes several other statutory requirements and preferences. These specify that when complete, the selected remedial action for this site must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified. The selected remedy must also be cost-effective and utilize permanent solutions and alternative treatment or resource recovery technologies to the maximum extent practical. Finally, the statute includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity,

or mobility of hazardous wastes as their principal element. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy provides protection of human health by reducing the existing threat posed by physical hazards and the possible spread of radioactive contamination to an inadvertent intruder. The remedy will provide similar benefits to animal life in the area. When implemented, the remedy will also reduce further degradation of the environment by eliminating the debris as a source of environmental contamination.

Compliance with ARARs

The selected remedy will comply with all the ARARs shown in Table 1, and a waiver is not requested.

Cost Effectiveness

The remedy will permanently remove the contaminated surface debris from the site and is, therefore, the most cost-effective alternative available.

Use of Permanent Solutions and Treatment Technologies

The selected remedy provides a permanent solution to the existing and future threats posed by contaminated surface debris at WAG 11. It does not utilize a treatment technology because a viable method is not available. The selected represents the best balance of tradeoffs, given the limited scope of the action.

Preference for Treatment

At this time, viable technologies that address radioactive contamination are not readily available; containment and isolation from the environment while radioactive decay occurs appears to be the most desirable method of mitigation. This remedy is not the final solution or action for remediating WAG 11; it is an interim action only. Although this interim action will not completely remediate the site, it will remove some known sources of contamination currently in direct contact with soils. Because of the wide variety and condition of the debris and nature of contaminants of concern, treatment is not a viable option at this time. Treatment will be addressed in the decision document reflecting the final remedy selection for this site.

EXPLANATION OF SIGNIFICANT CHANGES

The Proposed Plan for the ORNL WAG 11 Interim Remedial Action was released for public comment in July 1992. The Plan identified Alternative 4, Disposal of Debris at the WAG 6 Waste Consolidation Area, as the preferred alternative. After the Proposed Plan was released for public review, it was found that the Waste Consolidation Area may not be ready to receive wastes in time to be used for this interim remedial action. A disposal option consistent with the intent of the preferred alternative was identified and selected. The new disposal option provides better confinement of the wastes from the environment than the Waste Consolidation Area. Debris will be placed in low-level waste silos at WAG 6. Silo disposal is a currently utilized disposal technology utilizing an engineered facility within WAG 6, designed and operated to isolate the waste material from surface water and groundwater, control subsidence and provide radiation protection. Additional costs as shown in Table 2 for silo disposal are attributed to the inclusion of silo construction costs. In the original estimate, facility construction costs were assumed to be included in the WAG 6 remedial action effort.

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